Name: Saweer Ebrahimi
Class: ISE. Third class

# Assignment of Advanced Database

1- What does "data independence" mean and which two forms of data independence exist? There are two types of data independence. Physical data independence means that database application programs are not dependent on physical structure of stored data. Logical data independence means that database application programs are independent of logical structure.

2- Which is the main concept of the relational model? A relation also called table is the main concept of relational model. It consists of tables with rows and columns.

3- What does the employee table represent in the real world? And what does the row in this table with data for Ann Jones represent? It represents an entity and data for Ann Jones shows or specifies an instance of the entity.

4- What does the works_on table represent in the real world (and in relation to the other tables of the sample database)? It shows the relationship between employees and projects. Other tables show an entity and works_on represent relationship between two entities.

5- Let book be a table with two columns: isbn and title. Assuming that isbn is unique and there are no identical titles, answer the following questions: a. Is title a key of the table? b. Does isbn functionally depend on title? C. Is the book in 3NF?

a- Yes its key because its unique. b- Yes it depends on title because each title determines each corresponding isbn. C- For sure its in 3NF because there are no dependencies between non-key attributes

6- Let order be a table with the following columns: order_no, customer_no, discount. If the column customer_no is functionally dependent on order_no and the column discount is functionally dependent on customer_no then: a- Is order_no a key of table? b- Is customer_no a key of the table?

a- Yes it is key because other columns are dependent on it. b- No it's not key because of FD on order_no

7- Let company be a table with the following columns: company_no, location. Each company has one or more locations. In which normal form is the company table? It is not in any normal form because column location is multivalued and cannot be in 1NF.

8- Let supplier be a table with following columns: supplier_no, article, city. The key is the combination of first two columns. Each supplier delivers several articles, and each article is delivered by several suppliers. There is only one supplier in each city. a- In which normal is supplier table? b- How can yeer resolve existing FD? a- It is in 1NF because city column is functional dependend on supplier_no. b- by using (supplier1 (supplier_no, article), (supplier2 (supplier_no, city))

9- Let R(A,B,C) be a relation with FD B ⇒ C. (Then underlined attributes A and B builds the composite key, and C is functionally dependent on B). In which normal form is relation R? It is in 1NF because C is dependent on B which is partial key. ⑩ Let R(A,B,C) be a relation with FD C → B. The underlined attributes A and B builds composite key and B is dependent on C). In which normal form is the relation R? The relation R is in 3NF but its design is not appropriate because the primary key should be combination of columns A and C.

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